Competitiveness and international climate policy

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Outline

- Basic framework of climate policy today
- Competitiveness and climate policy: defining and assessing the issue
- Overview of solutions and pitfalls
- Conclusion

Global greenhouse gas emission reduction policies

- Global emission scenarios in discussion (G8 etc.): -50% from current / 1990 levels by 2050
- Cannot be done without a price tag on CO_2 and other GHG emissions
  - The international carbon market: a means to this end
- Cannot be done by developed countries alone. E.g. by 2020, to preserve a 450 ppmv CO_2 concentration goal:
  - Developed countries: -30% from 1990 levels
  - Developing countries: -10 -25% from business-as-usual levels

➔ All of the above implies an energy (supply and demand) revolution – some sectors will win, others will lose. New conditions for competition are necessary.

Competitiveness and climate
Defining the issue

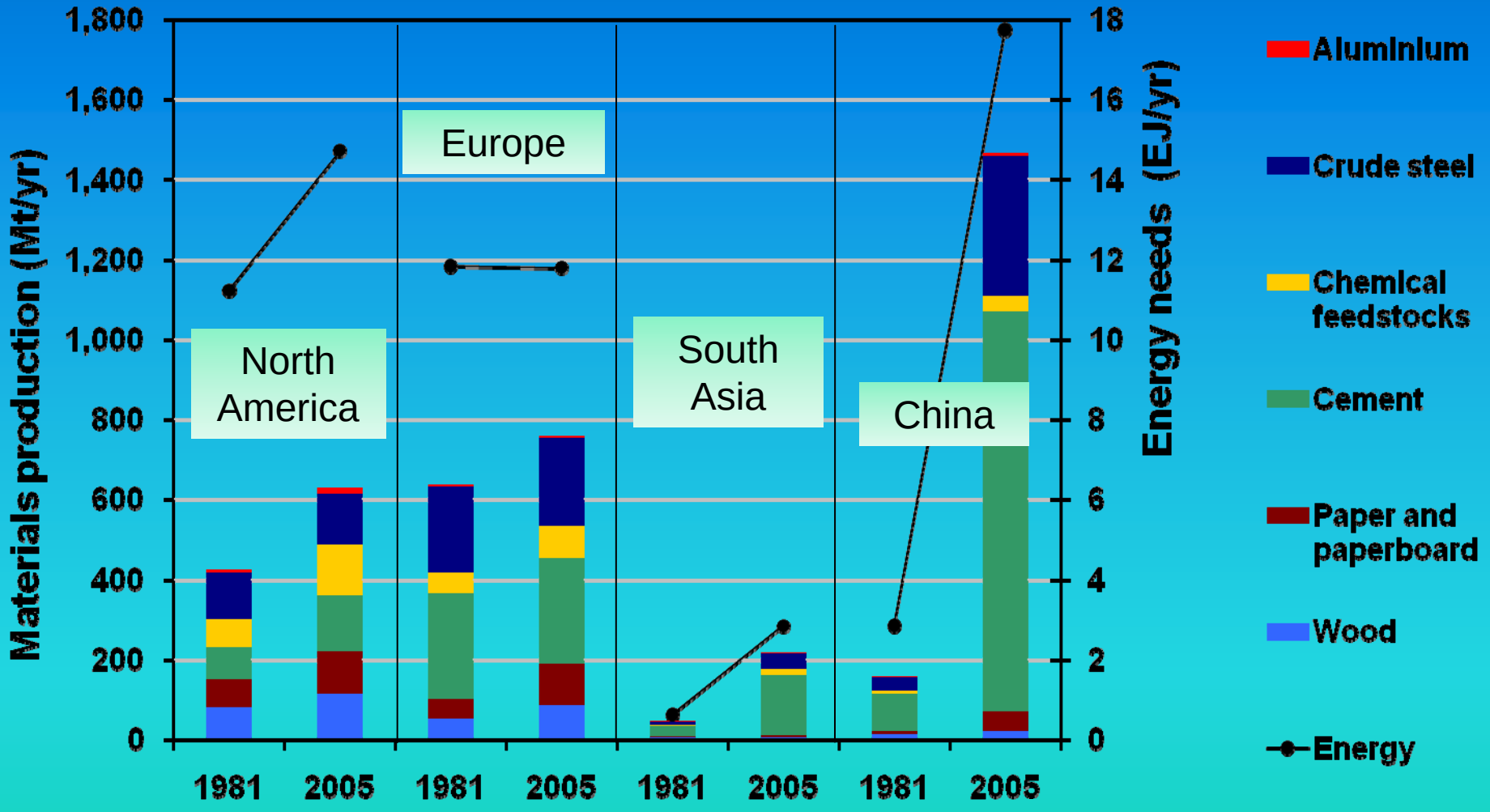
A few words on competitiveness issues and climate policy

- Starting point: the EU emissions trading scheme introduces cost on industry and power generation – other regions lag behind in climate policy

- Concern: enhanced competitiveness of non-EU producers could lead to ‘carbon leakage’
  - Reductions achieved by the EU ETS could result in higher emissions elsewhere

- Which activities? Trade-exposed, energy- or GHG-intensive
  - Aluminium: **76%**, of global output is traded, both GHG and electricity intensive
  - Iron and steel: **32%**, high CO_2 content
  - Cement : **6%** but very high carbon cost per value added

Industrial output growth: 1981-2005
Main products / world regions



Source: IEA, 2007, *Energy use in the new millennium*.

Carbon cost impact: Estimating orders of magnitude

- Direct costs: allowance purchase
- Indirect costs: effect of CO_2 price on electricity prices
- Three scenarios:
  - Installations face 2% or 10% shortage of allowances
  - Full auctioning
- Compare CO_2 costs with standard production costs for:
  - *Iron and steel (incl. electric arc), cement, paper, and aluminium*
- Euro 20 /tCO_2
  - *Full pass of carbon cost into electricity prices*

Simulated Cost of CO2 Constraint for Large Energy Users in the EU

(allowance price = € 20/tCO_2)

% final product cost increase	Integrated steel 1.9 tCO_2/t	Electric arc furnace steel 0.15 tCO_2/t	Cement 0.9tCO_2/t	News-print 0.4tCO_2/t	Aluminium
allowance purchase = 2% of ex-ante emissions	1.2 %	1.7 %	4 %	2 %	[8 %] Increased electricity price
Allowance purchase = 10% of ex-ante emissions	2.4 %	1.85 %	7 %	3 %	[8 %]
Full opportunity cost of allowances (= full auction) [increase from electricity price]	15.4 % [1 %]	3 % [1.7 %]	38 % [4 %]	8 % [2 %]	[8 %]

Reinaud, J. (2005): '*Industrial competitiveness under the EU ETS*' IEA Information Paper

How significant is carbon leakage?

- Ex ante simulations
  - Carbon leakage rates vary
  - Methodological uncertainties abound
- Ex post assessments
  - Monitoring costs and price changes
  - Monitoring trade flows
  - ➔ Measurable impact of CO_2 cost?

How do we measure carbon leakage?

- a national sector's perspective -

Increase in emissions outside EU (as a result of the EU ETS)

=

Decrease in emissions in EU (as a result of the EU ETS)

Decrease in unitary emissions

Intended!

Decrease in absolute demand for CO_2 intensive products (lower production volumes)

Demand Elasticity

Intended!

Not intended!

Loss of international market share (trade flows)

- **Transport costs**
- **Capacity utilisation**
- **Barriers to trade**
- **Product differentiation**
- **....**

Short Term

Longer Term

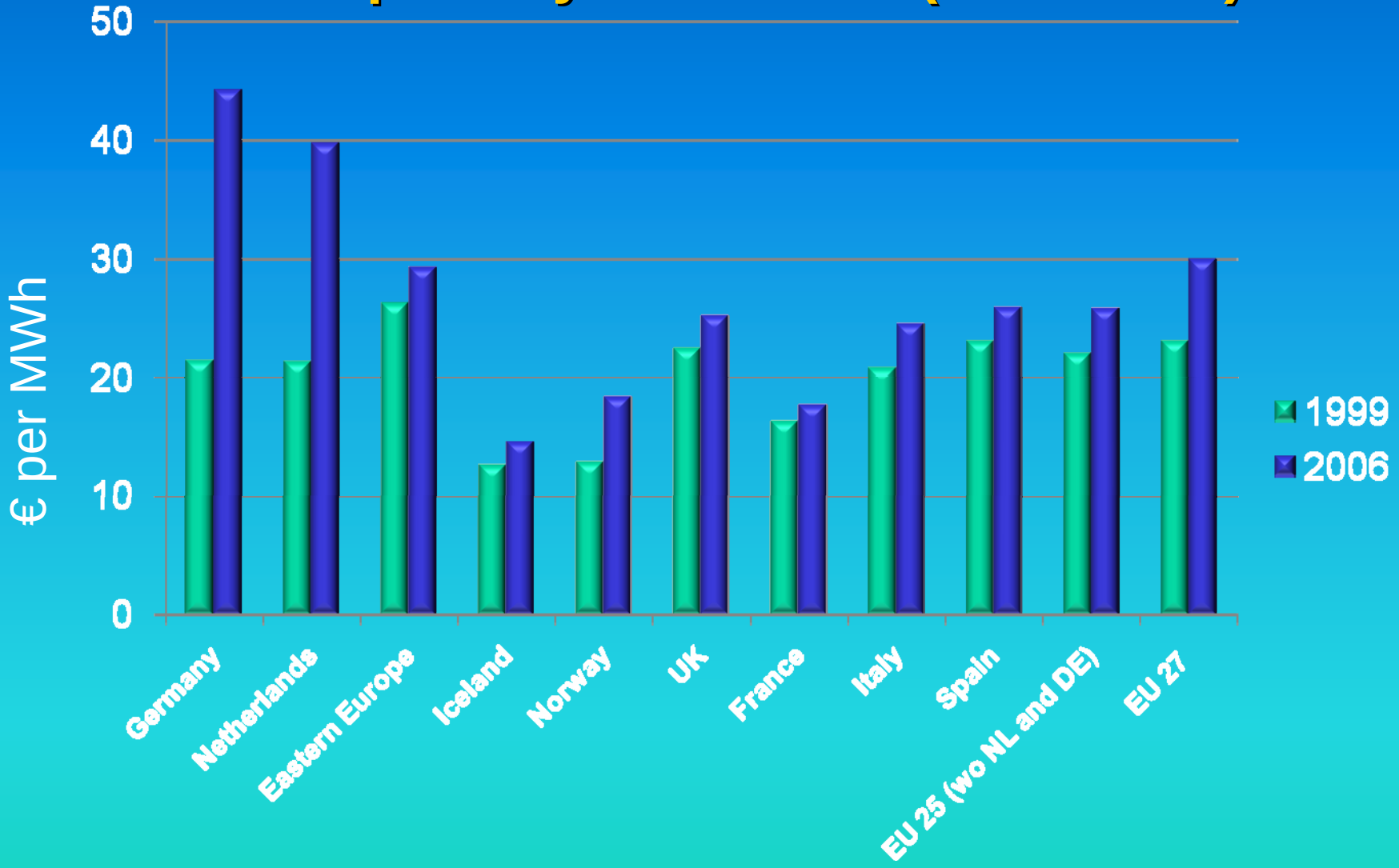
Source: Reinaud (2008)

Preliminary assessment: aluminium

- 2005-2007

- Primary aluminium
  - Extremely electricity intensive commodity
  - Expected effects of electricity price increases
  - Price set globally (London Metals Exchange): no ability to pass CO_2/electricity cost to market

Estimated electricity cost variations in primary aluminium (1999-2006)



How much of the increase is linked to CO_2 vs interruption of long-term contracts?

Source: Reinaud (2008), based on CRU and EAA www.crugroup.com

Any evidence of leakage in aluminium? (2005-2007)

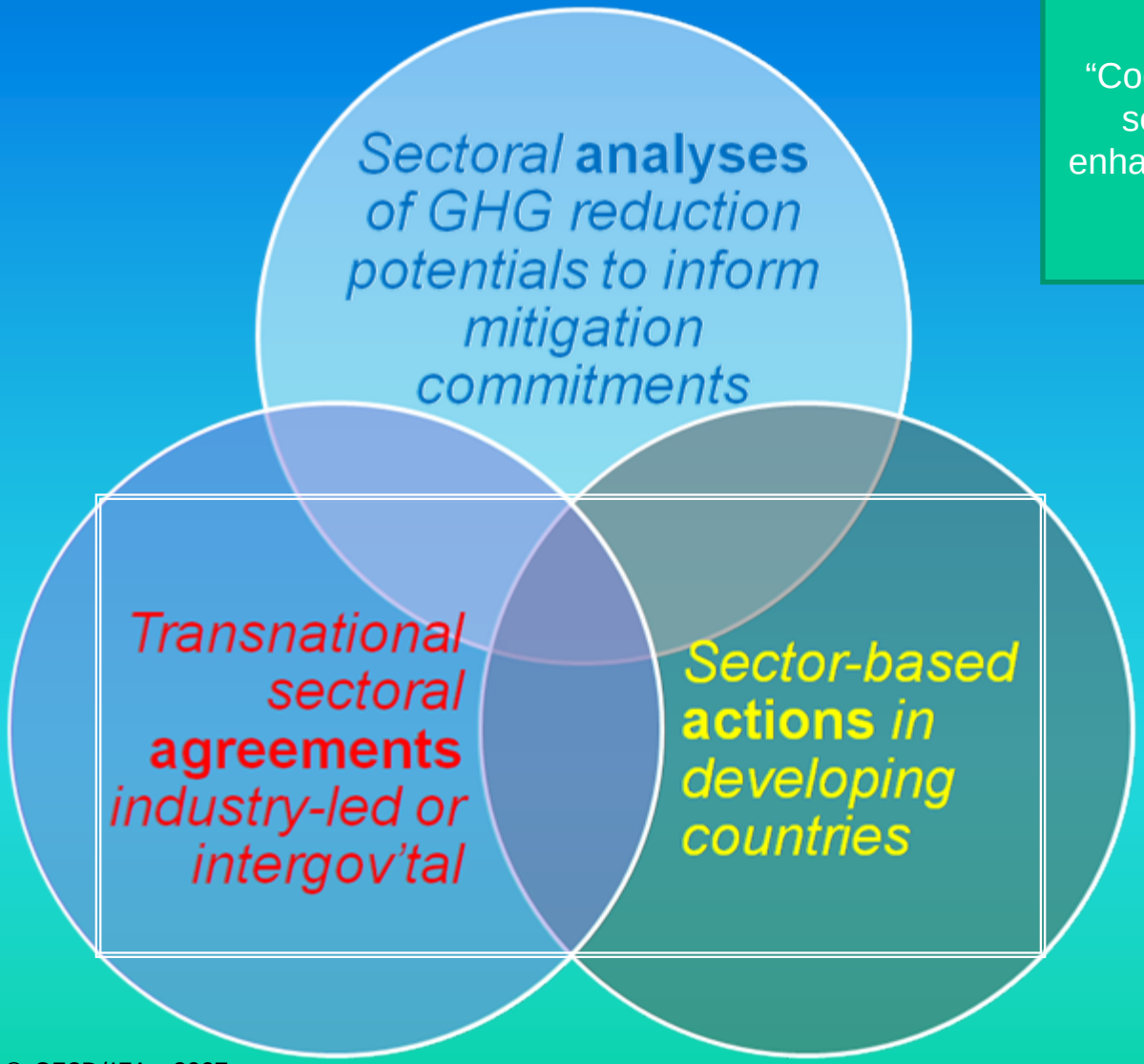
- Effects on trade flows?
  - No statistical impact of CO2 cost … but:
  - Most smelters under long-term electricity contracts – limited exposure to wholesale price increases
  - Booming international aluminium market – reopening of a smelter in Germany, still profitable in spite of higher electricity prices
- Today's situation probably a poor indicator of tomorrow's
  - Termination of long-term electricity contracts
    - New contractual arrangements: how important will CO2 cost be?
  - Possible inclusion of aluminium emissions in EU ETS

Carbon leakage
Overview of solutions and pitfalls

Solving carbon leakage?

- Border adjustments
  - Tax carbon, then tax imports and rebate exports
  - Include imports in the EU ETS
    - On the basis of which CO_2 content for goods
    - Think carefully about CO_2 price effects and indirect effects (electricity)
    - WTO compatibility uncertain
- Allocation modes
  - Free allocation + closure rule
    - Does not address indirect cost (electricity)
    - Encourages installations to stay
  - Allocation follows output volume
    - Removes incentive to pass CO2 cost in commodity prices
- "Sectoral approaches": to be determined

What is meant by "sectoral approaches" (SA)



UNFCCC
"Cooperative sectoral approaches and sector-specific actions, in order to enhance implementation of Article 4.1(c) of the Convention" – Bali A.P.
(intergovernmental)

Asia-Pacific Partnership on Clean Development and Climate

EC / int'l car manufacturers associations
(public-private)

Aluminium: IAI
Cement: WBCSD-CSI
Iron and steel: IISI
(private)

Conclusions

Debate on competitiveness and climate policy is raging

- A prominent element in legislative proposals and discussions in EU, US, Japan, Australia, New Zealand…
  - Targeting emerging economies
- How significant could leakage be?
  - In worst case scenarios, limited impact on global emissions
  - But very sensitive political issue in developed countries
- Strong reluctance to put the issue on the UNFCCC table
- Best addressed by appropriate adjustments to domestic policies?
- A reality: most of the growth in energy-intensive industries has been and will be outside Europe
  - Local infrastructure needs

Concluding remarks

- No level carbon playing field. Impact on:
  - Profitability? Market shares? Location of next vintage of investments?
- How significant could this problem be?
  - Do not speculate: simulate and monitor expected effects
  - Overall cost-benefit of addressing the problem
    - Special treatment of exposed activities? Exemptions? Sectoral agreements? Border adjustments?
  - The political cost of not acting
- Ambitious climate policy implies changing relative competitiveness of sectors, encouraging low-carbon innovations and preparing for new playing field

➔ **Policy challenge**: Balance prime mover advantage with risk of carbon leakage

Thank you

further questions?

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